

PATENT
ATTORNEY DOCKET NO. 00786/206002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Frederick M. BOYCE

Art Unit:

Serial No.: 08/752,032

Examiner:

Filed : November 19, 1996

Title : USE OF A BACULOVIRUS TO EXPRESS AN EXOGENOUS GENE IN
A MAMMALIAN CELL

Assistant Commissioner of Patents
Washington, DC 20231

#5
FL
5/15/97

RECEIVED
MAR 04 1997
GROUP 1800

INFORMATION DISCLOSURE STATEMENT


Applicant submits the references listed on the attached
form PTO 1449.

Under 35 USC 120, this application claims priority from
application Serial No. 08/311,157, filed on September 23, 1994.
The references listed on the attached PTO Form 1449 were
submitted to and/or cited by the Office on the prior application
and, therefore, are not provided in this application.

This statement is being filed before the mailing date
of a first Office action on the merits. Please apply any charges
or credits to Deposit Account No. 06-1050, Reference No.
00786/206002.

Respectfully submitted,

Date: February 26, 1997


Eldora L. Ellison, Ph.D.
Reg. No. 39,967

Fish & Richardson P.C.
601 13th Street NW
Washington, D.C. 20005

Telephone: 202/783-5070
Facsimile: 202/783-2331
71030.W11

SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 00786/206002		SERIAL NO. 08/752,032	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) (37 CFR 1.98(b))				APPLICANT Frederick M. Boyce		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> RECEIVED MAR 4 1997 </div>	
				FILING DATE November 19, 1996			
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
<i>BL</i> ↓	AA	5 0 0 4 6 8 7	04/02/1991	Miller	435	69.1	 <div style="border: 1px solid black; padding: 5px; display: inline-block;"> GROUP 1800 </div>
	AB	4 8 7 9 2 3 6	11/07/1989	Smith et al.	435	235	
	AC	4 7 4 5 0 5 1	05/17/1988	Smith et al.	435	68	
FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION							
	DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
<i>BL</i>	AD	WO 95/23866	09/1995	PCT			
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)							
<i>BL</i> 	AE	Ashwell G. et al.; "Carbohydrate-Specific Receptors of the Liver"; <u>Ann. Rev. Biochem.</u> 51:531-54 (1982)					
	AF	Blissard G.W. et al.; "Baculovirus Diversity and Molecular Biology"; <u>Annu. Rev. Entomol.</u> 35:127-55 (1990)					
	AG	Blissard G.W. et al.; "Baculovirus gp64 Envelope Glycoprotein Is Sufficient To Mediate pH-Dependent Membrane Fusion"; <u>J. of Virology</u> 66:6829-6835 (1992)					
	AH	Burhans W.C. et al.; "DNA Replication Origins in Animal Cells: A Question of Context?"; <u>Science</u> 263:639-640 (1994)					
	AI	Burns J.C. et al.; "Vesicular Stomatitis Virus G Glycoprotein Pseudotyped Retroviral Vectors: Concentration to Very High Titer and Efficient Gene Transfer into ..."; <u>Proc. Natl. Acad. Sci. USA</u> 90:8033-8037 (1993)					
	AJ	Carbonell L.F. et al.; "Baculovirus-Mediated Expression of Bacterial Genes in Dipteran and Mammalian Cells" <u>Journal of Virology</u> , 56:153-160 (1985)					
	AK	Carbonell L.F. et al.; "Baculovirus Interaction with Nontarget Organisms: A Virus-Borne Reporter Gene Is Not Expressed in Two Mammalian Cell Lines"; <u>Applied and Environmental Microbiology</u> 53:1412-1417 (1987)					
	AL	Charreau B. et al.; "Establishment of Porcine Cell Lines Producing a Murine Recombinant Retrovirus in Order to Transfer the nlslacZ Gene into Porcine Cells"; <u>Res. Virol.</u> 142:343-351 (1991)					
	AM	Cotten M. et al.; "Receptor-Mediated Transport of DNA into Eukaryotic Cells"; <u>Academic Press, Inc.</u> 217:618-644 (1993)					
	AN	Cristiano R.J. et al.; "Hepatic Gene Therapy: Adenovirus Enhancement of Receptor-Mediated Gene Delivery and Expression in Primary Hepatocytes"; <u>Proc. Natl. Acad. Sci. USA</u> 90:2122-2126 (1993)					
AO	Demarquoy J.; "Retroviral-Mediated Gene Therapy for the Treatment of Citrullinemia. Transfer and Expression of Argininosuccinate Synthetase in Human Hematopoietic Cells"; <u>Experientia</u> 49:345-348 (1993)						
EXAMINER				DATE CONSIDERED			
<i>B. Langford</i>				<i>12/02/97</i>			
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 00786/206002		SERIAL NO. 08/752,032	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) (37 CFR 1.98(b))				APPLICANT Frederick M. Boyce			
				FILING DATE November 19, 1996		GROUP	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	BA	PATENT NUMBER 4,914,027	ISSUE DATE 4/1990	PATENTEE Knapp et al.	CLASS 435	SUBCLASS 69.6	FILING DATE IF APPROPRIATE
FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION							
		DOCUMENT NUMBER 23 1997	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION YES NO
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)							
BC		Demetriou A.A. et al.; "Replacement of Liver Function in Rats by Transplantation of Microcarrier-Attached Hepatocytes"; <u>Science</u> 233:1190-1192 (1986)					
BD		Grompe M. et al.; "Gene Therapy in Man and Mice: Adenosine Deaminase Deficiency, Ornithine Transcarbamylase Deficiency, and Duchenne Muscular Dystrophy"; <u>Adv. in Experimental Medicine & Biology</u> 309B:51-56 (1991)					
BE		Grompe M. et al.; "Retroviral-Mediated Gene Transfer of Human Ornithine Transcarbamylase into Primary Hepatocytes of spf and spf-ash Mice"; <u>Human Gene Therapy</u> 3:35-44 (1992)					
BF		Groner, et. al; "Interaction of Autographa californica Nuclear Polyhedrosis Virus with Two Nonpermissive Cell Lines"; <u>Intervirology</u> 21:203-209 (1984)					
BG		Hartig P.C. et al.; "Insect Virus: Assays for Toxic Effects and Transformation Potential in Mammalian Cells"; <u>Applied and Environmental Microbiology</u> 55:1916-1920 (1989)					
BH		Hartig P.C. et al.; "Insect Virus: Assays for Viral Replication and Persistence in Mammalian Cells"; <u>J. Virological Methods</u> 31:335-344 (1991)					
BI		Hata A. et al.; "Structure of the Human Ornithine Transcarbamylase Gene"; <u>J. Biochem (Tokyo)</u> 103:302-308					
BJ		Hodges P.E. et al.; "The spf ^{ash} Mouse: A Missense Mutation in the Ornithine Transcarbamylase Gene Also Causes Aberrant mRNA Splicing"; <u>Proc. Natl. Acad. Sci. USA</u> 86:4142-4146 (1989)					
BK		Horwich A.L.; "Inherited Hepatic Enzyme Defects as Candidates for Liver-Directed Gene Therapy"; <u>Current Topics in Microbiology and Immunology</u> 168:185-200 (1991)					
BL		Jones S.N. et al.; "Ectopic Correction of Ornithine Transcarbamylase Deficiency in Sparse Fur Mice"; <u>J. Biological Chemistry</u> 265:14684-14690 (1990)					
BM		Jung, et al.; "A Novel β -Galactoside-Binding Lectin in Adult Rat Kidney"; <u>J. Biochem.</u> 116:547-553 (1994)					
BN		Kasahara, et al.; "Tissue-Specific Targeting of Retroviral Vectors Through Ligand-Receptor Interactions"; <u>Science</u> 266:1373-1376 (1994)					
EXAMINER B Campbell				DATE CONSIDERED 12/24/97			
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 00786/206002		SERIAL NO. 08/752,032	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) (37 CFR 1.98(b))				APPLICANT Frederick M. Boyce			
				FILING DATE November 19, 1996		GROUP	

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	CA 0115 1111					

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
					YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

BC ↓	CC	Lodish H.F.; "Recognition of Complex Oligosaccharides by the Multi-Subunit Asialoglycoprotein Receptor"; <u>Elsevier Science Publishers</u> 374-377 (1991)
	CD	Maestri N.E. et al.; "Prospective Treatment of Urea Cycle Disorders"; <u>J. of Pediatrics</u> 119:923-928 (1991)
	CE	McGrane M.M. et al.; "Metabolic Control of Gene Expression: In Vivo Studies With Transgenic Mice"; <u>Elsevier Science Publishers</u> 17:40-44 (1992)
	CF	Midoux P. et al.; "Specific Gene Transfer Mediated by Lactosylated Poly-L-Lysine into Hepatoma Cells"; <u>Nucleic Acids Research</u> 21:871-878 (1993)
	CG	Mulligan R.C.; "The Basic Science of Gene Therapy"; <u>Science</u> 260:926-932 (1993)
	CH	Shen R. et al.; "Tissue-Specific Regulation of Human α_1 -Antitrypsin Gene Expression in Transgenic Mice"; <u>DNA</u> 8:101-108 (1989)
	CI	Shimada T. et al.; "Correction of Ornithine Transcarbamylase (OTC) Deficiency in spf-ash Mice by Introduction of Rat OTC Gene"; <u>Elsevier Science Publishers</u> 279:198-200 (1991)
	CH	Spiess, Martin; "The Asialoglycoprotein Receptor: A Model for Endocytic Transport Receptors"; <u>Biochemistry</u> 29:10009-10018 (1990)
	CK	Stratford-Perricaudet et al.; "Evaluation of the Transfer and Expression in Mice of an Enzyme-Encoding Gene Using a Human Adenovirus Vector"; <u>Human Gene Therapy</u> 1:241-256 (1990)

EXAMINER B Campbell	DATE CONSIDERED 12/22/97
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 00786/206002		SERIAL NO. 08/752,032		
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) (37 CFR 1.98(b))				APPLICANT Frederick M. Boyce				
				FILING DATE November 19, 1996		GROUP		
U.S. PATENT DOCUMENTS								
EXAMINER INITIAL		PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION								
		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION YES NO	
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)								
BC DD DE DF DG DH DI DJ DK DL	DC	Tan S.; "Liver-Specific and Position-Effect Expression of a Retinol-Binding Protein-lacZ Fusion Gene (RBP-lacZ) in Transgenic Mice"; <u>Developmental Biology</u> 146:24-37 (1991)						
	DD	Volkman, et al.; "In Vitro Survey of Autographa californica Nuclear Polyhedrosis Virus Interaction with Nontarget Vertebrate Host Cells" <u>Applied and Environmental Microbiology</u> 45:1085-1093 (1983)						
	DE	Wagner E. et al.; "Transferrin-Polycation Conjugates as Carriers for DNA Uptake into Cells"; <u>Proc. Natl. Acad. Sci. USA</u> 87:3410-3414 (1990)						
	DF	Wilson J.M. et al.; "A Novel Mechanism for Achieving Transgene Persistence in Vivo After Somatic Gene Transfer into Hepatocytes"; <u>Journal of Biological Chemistry</u> 267:11483-11489 (1992)						
	DG	Wilson J.M. et al.; "Hepatocyte-Directed Gene Transfer In Vivo Leads to Transient Improvement of Hypercholesterolemia in Low Density Lipoprotein ..."; <u>J. Biol. Chemistry</u> 267:963-967 (1992)						
	DH	Wu G.Y. et al.; "Evidence for Targeted Gene Delivery to Hep G2 Hepatoma Cells in Vitro"; <u>Biochemistry</u> 27:887-892 (1988)						
	DI	Wu G.Y. et al.; "Receptor-Mediated Gene Delivery and Expression in Vivo"; 263:14621-14624 (1988)						
	DJ	Wu G.Y. et al.; "Receptor-Mediated Gene Delivery in Vivo"; <u>J. Biological Chemistry</u> 266:14338-14342 (1991)						
	DK	Wu G.Y. et al.; "Receptor-Mediated in Vitro Gene Transformation by a Soluble DNA Carrier System"; <u>J. Biological Chemistry</u> 262:4429-4432 (1987)						
	DL	Wu G.Y. et al.; "Targeting Genes: Delivery and Persistent Expression of a Foreign Gene Driven by Mammalian Regulatory Elements in Vivo"; <u>J. Biological Chemistry</u> 264:16985-16987 (1989)						
	EXAMINER B Campbell				DATE CONSIDERED 12/22/87			
	EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

SUBSTITUTE FORM PTO-1449
(MODIFIED)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTY. DOCKET NO.

00786/206002

SERIAL NO.

08/752,032

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT
(Use several sheets if necessary)

(37 CFR 1.98(b))

APPLICANT

Frederick M. Boyce

FILING DATE

November 19, 1996

GROUP

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	EA						
	EB						
	EC						
	ED						
	EE						
	EG						
	EH						
	EI						
	EJ						
	EK						
	EL						

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	EM							
	EN							
	EO							
	EP							
	EQ							

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

BC	ER	Young J.A.T. et al.; "Efficient Incorporation of Human CD4 Protein into Avian Leukosis Virus Particles";
		Science 250:1421-1423 (1990)
L	ES	Boyce, F.M. et al.; "Baculovirus-mediated gene transfer into mammalian cells"; Proc. Nat'l. Acad. Sci., USA;
		93:2348-2352 (1996)
L	ET	Fraser, M.J.; "The baculovirus-infected insect cell as a eukaryotic gene expression system"; Curr. Top.
		Microbiol. Immunol.; 158:131-172 (1992)

EXAMINER

B Campbell

DATE CONSIDERED

12/22/97

EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form (PTO-

SUBSTITUTE FORM PTO-1449
(MODIFIED)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTY. DOCKET NO.

00786/206002

SERIAL NO.

08/752,032

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT
(Use several sheets if necessary)

(37 CFR 1.98(b))

APPLICANT

Frederick M. Boyce

FILING DATE

November 19, 1996

GROUP

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	FA						
	FB						
	FC						
	FD						
	FE						
	FF						
	FG						
	FH						
	FI						
	FJ						
	FK						

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	G							
	H							
	I							
	J							
	K							

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

L	Trujillo, M.A. et al.; "Functional analysis of a liver-specific enhancer of the hepatitis B virus"; Proc.
	Nat'l. Acad. Sci., USA; 88:3797-3801 (1991)
M	
N	

EXAMINER

B Campbell

DATE CONSIDERED

12/22/89

EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.